

WHAT IS CLAIMED IS:

5 1. A system operable to communicate time-division multiplexed information and asynchronous transfer mode cells, comprising:

a primary rate switching fabric operable to receive a first plurality of transport signals, and to switch the first plurality of transport signals at a first level;

10 a sub-rate switching fabric operable to receive a second plurality of transport signals carrying time-division multiplexed information and to switch the second plurality of transport signals at second level that is a more granular level than the first level; and

15 an asynchronous transfer mode switching fabric operable to receive a third plurality of transport signals carrying asynchronous transfer mode cells, and to switch asynchronous transfer mode cells among the third plurality of transport signals carrying asynchronous transfer mode cells.

20 2. The system of Claim 1, wherein the primary rate switching fabric comprises a first time slot interchange operable to switch the primary rate signals at a synchronous transport level-one level.

25 3. The system of Claim 1, wherein the sub-rate switching fabric comprises a digital cross-connect operable to switch the primary rate signals at a virtual tributary level.

30

4. The system of Claim 1, wherein the asynchronous transfer mode switching fabric comprises an asynchronous transfer mode add/drop multiplexer operable to perform asynchronous transfer mode layer processing.

5

5. The system of Claim 1, further comprising a second time slot interchange operable to receive the transport signals, to route the second plurality of transport signals to the sub-rate switching fabric, and to route the third plurality of transport signals to the asynchronous transfer mode switching fabric.

10

6. The system of Claim 1, further comprising a signal distributor operable to receive the first, second, and third pluralities of transport signals and to communicate each of the pluralities of transport signals to its associated switching fabric.

15

7. The system of Claim 6, wherein the signal distributor comprises:

20

a bridge operable to duplicate the first, second, and third pluralities of transport signals, and to send one copy of the transport signals to the primary switching fabric and another copy of the transport signals to a second time slot interchange; and

25

a second time slot interchange operable to receive the transport signals, to route the second plurality of transport signals to the sub-rate switching fabric, and to route the third plurality of transport signals to the asynchronous transfer mode switching fabric.

30

5 8. The system of Claim 6, further comprising a signal selector operable to receive switched transport signals from the primary rate switching fabric, the sub-rate switching fabric, and the asynchronous transfer mode switching fabric and to facilitate transmission of the switched transport signals to external network elements.

9. The system of Claim 8, wherein the signal selector comprises:

10 a third time slot interchange operable to receive switched transport signals from the asynchronous transfer mode switching fabric and the sub-rate switching fabric, and to associate the switched transport signals with time slots on which the transport signals were originally received in the second time slot interchange; and

15 a multiplexer operable to receive switched transport signals from the primary rate switching fabric and the third time slot interchange, and to select a set of switched transport signals for transmission.

20

10. A system operable to communicate a plurality of signals having various signal formats including time-division multiplexed signals and signals carrying asynchronous transfer mode cells, the system comprising:

5 an interface card operable to receive a plurality of incoming signals, to format the incoming signals into transport signals, to route the transport signals to at least one of a plurality of switching fabrics, to receive switched transport signals from at least one of the
10 switching fabrics, and to facilitate transmission of the switched transport signals;

a primary rate switching fabric operable to receive a first plurality of transport signals and to switch the first plurality of transport signals at a first level;

15 a sub-rate switching fabric operable to receive a second plurality of transport signals carrying time-division multiplexed information and to switch the second plurality of transport signals at second level that is a more granular level than the first level; and

20 an asynchronous transfer mode switching fabric operable to receive a third plurality of transport signals carrying asynchronous transfer mode cells, and to switch asynchronous transfer mode cells among the third plurality of transport signals carrying asynchronous transfer mode
25 cells.

11. The system of Claim 10, wherein the interface card comprises a line card operable to provide an interface between a communications line and at least one of the
30 switching fabrics.

12. The system of Claim 10, wherein the interface card comprises a tributary card operable to provide an

interface between a tributary and at least one of the switching fabrics.

13. The system of Claim 10, further comprising a second time slot interchange operable to receive the transport signals, to route the second plurality of transport signals to the sub-rate switching fabric, and to route the third plurality of transport signals to the asynchronous transfer mode switching fabric.

14. The system of Claim 10, further comprising a signal distributor operable to receive the first, second, and third pluralities of transport signals and to communicate each of the pluralities of transport signals to its associated switching fabric.

15. The system of Claim 14, wherein the signal distributor comprises:

a bridge operable to duplicate the first, second, and third pluralities of transport signals, and to send one copy of the transport signals to the primary switching fabric and another copy of the transport signals to a second time slot interchange; and

a second time slot interchange operable to receive the transport signals, to route the second plurality of transport signals to the sub-rate switching fabric, and to route the third plurality of transport signals to the asynchronous transfer mode switching fabric.

5 16. The system of Claim 14, further comprising a signal selector operable to receive switched transport signals from the primary rate switching fabric, the sub-rate switching fabric, and the asynchronous transfer mode switching fabric and to facilitate transmission of the switched transport signals to external network elements.

17. The system of Claim 16, wherein the signal selector comprises:

10 a third time slot interchange operable to receive switched transport signals from the asynchronous transfer mode switching fabric and the sub-rate switching fabric, and to associate the switched transport signals with time slots on which the transport signals were originally received in the second time slot interchange; and

15 a multiplexer operable to receive switched transport signals from the primary rate switching fabric and the third time slot interchange, and to select a set of switched transport signals for transmission.

20

18. An interface card operable to interface a communication system having a switching complex operable to receive and process a plurality of transport signals carrying time-division multiplexed information and a plurality of transport signals carrying asynchronous transfer mode cells, wherein the switching complex comprises:

5 a primary rate switching fabric operable to receive a first plurality of transport signals and to switch the first plurality of transport signals at a first level;

10 a sub-rate switching fabric operable to receive a second plurality of transport signals carrying time-division multiplexed information and to switch the second plurality of transport signals at second level that is a more granular level than the first level; and

15 an asynchronous transfer mode switching fabric operable to receive a third plurality of transport signals carrying asynchronous transfer mode cells, and to switch asynchronous transfer mode cells among the third plurality of transport signals carrying asynchronous transfer mode cells.

19. A method of communicating time-division multiplexed information and asynchronous transfer mode cells using a single switching complex, the method comprising:

5 receiving at the switching complex a plurality of transport signals comprising:

a first transport signal comprising pass-through traffic requiring primary rate switching;

10 a second transport signal comprising sub-rate traffic requiring sub-rate switching; and

a third transport signal comprising asynchronous transfer mode cells requiring asynchronous transfer mode cell switching;

15 communicating each transport signal to a switching fabric operable to perform a switching function associated with that signal;

performing primary rate switching on the first transport signal;

20 performing sub-rate switching on the second transport signal; and

performing asynchronous transfer mode cell switching on the third transport signal.

25 20. The method of Claim 19, wherein communicating each transport signal comprises:

duplicating the transport signals;

communicating a first set of transport signals to the primary rate switching fabric;

30 communicating a second set of transport signals to the sub-rate switching fabric and the asynchronous transfer mode switching fabric.

21. The method of Claim 20, wherein communicating the second set of transport signals comprises:

communicating the second set of transport signals to a second time slot interchange;

5 associating the second plurality of transport signals with a first range of time slots associated with the sub-rate switching fabric;

10 associating the third plurality of transport signals with a second range of time slots associated with the asynchronous transfer mode switching fabric;

transmitting the second plurality of transport signals to the sub-rate switching fabric; and

15 and transmitting the third plurality of transport signals to the asynchronous transfer mode switching fabric.

22. The method of Claim 19, further comprising:

receiving a first plurality of switched transport signals from the primary rate switching fabric;

20 receiving a second plurality of switched transport signals from the sub-rate switching fabric;

receiving a third plurality of switched transport signals from the asynchronous transfer mode switching fabric; and

25 communicating the first, second, and third pluralities of switched transport cells to an interface card for transmission to an external network element.

23. The method of Claim 21, further comprising:

receiving from the primary rate switching fabric a first plurality of switched transport signals at a first set of time slots of a third time slot interchange;

5 receiving from the sub-rate switching fabric a second plurality of switched transport signals at a second set of time slots of a third time slot interchange; and

10 associating the first and second pluralities of switched transport signals with time slots corresponding to the time slots of the second time slot interchange on which the transport signals were originally received.

15